

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

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1. (Currently amended) A method of displaying physiological patient data from a cyclic physiological waveform, ~~the patient data including a plurality of data points, each data point representing the amplitude of the physiological patient data,~~ the method comprising the acts of:
 acquiring the physiological patient data from the cyclic physiological waveform, the physiological patient data including a plurality of data points, each data point representing an amplitude of the physiological patient data; and
 displaying the physiological patient data in a three dimensional representation.
 2. (Currently amended) A method as set forth in claim 1, wherein the physiological patient data is electrocardiogram data.
 3. (Currently amended) A method as set forth in claim 1, wherein the physiological patient data is blood pressure data.
 4. (Currently amended) A method as set forth in claim 1, wherein the physiological patient data is cardiac output data.
 5. (Currently amended) A method as set forth in claim 1, wherein the physiological patient data is pulse oximetry data.
 6. (Original) A method as set forth in claim 1, and further comprising the acts of storing the physiological patient data in a memory array.
 7. (Original) A method as set forth in claim 6, wherein the memory array is a waveform array.
 8. (Original) A method as set forth in claim 1, and further comprising the acts of parsing the physiological patient data into a series of waveforms.

9. (Original) A method as set forth in claim 8, wherein the series of waveforms are median waveforms.

10. (Currently amended) A method as set forth in claim 8, wherein the act of displaying includes the act of plotting the parsed waveforms in a temporal alignment to allow detection of long term trends in the physiological patient data.

11. (Currently amended) A method as set forth in claim 1, wherein the act of displaying further includes the act of assigning a representative X coordinate, Y coordinate, and Z coordinate, to each data point and the act of plotting each data point on the display to produce a three dimensional representation.

12. (Original) A method as set forth in claim 1, further including the act of parsing the data points into a series of median waveforms and wherein the act of displaying further includes the act of plotting the waveforms in a temporal alignment.

13. (Currently amended) A method as set forth in claim 1, wherein the act of displaying further includes the act of color-coding the amplitude values of the data points in the a relevant range.

14. (Original) A method as set forth in claim 13, wherein the relevant range is +0.5mV to 0.5mV.

15. (Currently amended) A method of displaying physiological patient data from a cyclic physiological waveform, the method comprising:
acquiring ~~the~~ physiological patient data from the cyclic physiological waveform;
storing the physiological patient data in a memory array; and
displaying the physiological patient data in a three dimensional representation, the act of displaying including the act of parsing the physiological patient data into a series of waveforms such that each successive waveform is plotted in a temporal alignment to allow detection of long

term trends in the physiological patient data, the act of parsing each waveform into a series of successive data points such that each data point has a coordinate that is plotted on the display to produce a three dimensional representation, each successive data point having a discrete amplitude, and the act of assigning a color according to the amplitude of the data point if the amplitude is within the a relevant range.

16. (Original) A method as set forth in claim 15, wherein said physiological patient data is electrocardiogram data.

17. (Currently amended) A method as set forth in claim 15, wherein the physiological patient data is blood pressure data.

18. (Currently amended) A method as set forth in claim 15, wherein the physiological patient data is cardiac output data.

19. (Currently amended) A method as set forth in claim 15, wherein the physiological patient data is pulse oximetry data.

20. (Original) A method as set forth in claim 15, wherein the memory array is a waveform array.

21. (Original) A method as set forth in claim 15, wherein the series of waveforms are median waveforms.

22. (Original) A method as set forth in claim 15, wherein the relevant range is +0.5mV to -0.5mV.

23. (Currently amended) An apparatus for displaying physiological patient data from a cyclic physiological waveform, ~~the data including a plurality of data points having an amplitude representing the value of the physiological parameter,~~ the apparatus comprising:

a display; and

a processor for producing a three dimensional representation of ~~the~~ physiological patient data from the cyclic physiological waveform, the physiological patient data including a plurality of data points, each data point having an amplitude representing a value of a physiological parameter.

24. (Currently amended) An apparatus as set forth in claim 23, and further comprising a patient ~~monitor~~ monitoring device as the source of physiological patient data.

25. (Currently amended) An apparatus as set forth in claim 24, wherein the patient ~~monitor~~ monitoring device includes a transducer for acquiring the physiological patient data from a patient.

26. (Original) An apparatus as set forth in claim 24, wherein the patient monitoring device is a Holter monitor.

27. (Original) An apparatus as set forth in claim 24, wherein the patient monitoring device is a stress-testing monitor.

28. (Original) An apparatus as set forth in claim 23, and further comprising a memory device connected to the processor.

29. (Currently amended) An apparatus as set forth in claim 28, wherein the physiological patient data is stored as in a memory array.

30. (Original) An apparatus as set forth in claim 29, wherein the memory array is a waveform array.

31. (Original) An apparatus as set forth in claim 23, wherein the display is a black and white display capable of displaying/generating shades of gray in between black and white.

32. (Original) An apparatus as set forth in claim 23, wherein the display is a red-blue-green color display.

33. (Original) An apparatus as set forth in claim 23, wherein the display has a plurality of pixels for displaying the respective coordinates.

34. (Original) An apparatus as set forth in claim 23, wherein the processor further comprises software for animation and walk through of three-dimensional representations.

35. (Currently amended) An apparatus as set forth in claim 23, wherein the processor further comprises software to receive the physiological patient data.

36. (Currently amended) An apparatus as set forth in claim 23, wherein the processor further comprises software to parse the physiological patient data.

37. (Currently amended) An apparatus as set forth in claim 36, where in the physiological patient data is parsed into a series of waveforms.

38. (Original) An apparatus as set forth in claim 37, wherein the series of waveforms are median waveforms.

39. (Original) An apparatus as set forth in claim 23, wherein the processor further comprises software to generate a waveform display on the display.

40. (Original) An apparatus as set forth in claim 39, wherein the waveform display places the data points at respective pixels on the display.

41. (Currently amended) A software program for generating a display of physiological patient data from a cyclic physiological waveform, the software program comprising:

- (a) a program module for acquiring the physiological patient data from the cyclic physiological waveform;

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- (b) a program module for storing the physiological patient data in a memory array;
 - (c) a program module for displaying a three dimensional representation of the physiological patient data;
 - (d) a program module for setting a current waveform to a first waveform in the memory array;
 - (e) a program module for providing a Z coordinate counter and initializing the Z coordinate counter to zero;
 - (f) a program module for providing a X coordinate counter and initializing the X coordinate counter to zero;
 - (g) a program module for providing a Y coordinate counter and initializing the Y coordinate counter to zero;
 - (h) a program module for determining the pixel color based on the Y coordinate of a data point;
 - (i) a program module for plotting a current data point of the current waveform at a current coordinate in the color determined in (h);
 - (j) a program module for incrementing the X coordinate counter and repeating (h) and (i) until all data points in the current waveform are plotted; and
 - (k) a program module for incrementing the Z coordinate counter and repeating (h)-(j) until all waveforms in the waveform array are plotted.

42. (Currently amended) An apparatus for displaying physiological patient data from a cyclic physiological waveform, ~~the data including a plurality of data points having an amplitude representing the value of the physiological parameter~~, said apparatus comprising:

a display; and

a means for producing a three dimensional representation of ~~the~~ physiological patient data from the cyclic physiological waveform, the physiological patient data including a plurality of data points, each data point having an amplitude representing a value of a physiological parameter.

43. (Original) An apparatus as set forth in claim 42, and further comprising a patient monitor device as a source of physiological patient data.

44. (Original) An apparatus as set forth in claim 43, wherein the patient monitor device includes a transducer for acquiring the physiological patient data from a patient.
45. (Original) An apparatus as set forth in claim 43, wherein the patient monitor device is a Holter monitor.
46. (Original) An apparatus as set forth in claim 43, wherein the patient monitor device is a stress-testing monitor.
47. (Original) An apparatus as set forth in claim 42, wherein the means for producing a three dimensional representation includes storing the physiological data.
48. (Original) An apparatus as set forth in claim 47, wherein the physiological patient data is stored in a memory array.
49. (Original) An apparatus as set forth in claim 48, wherein the memory array is a waveform array.
50. (Original) An apparatus as set forth in claim 42, wherein the display is a black and white display capable of displaying/generating shades of gray in between black and white.
51. (Original) An apparatus as set forth in claim 42 wherein the display is a red-blue-green color display.
52. (Original) An apparatus as set forth in claim 42, wherein the display has a plurality of pixels for displaying the respective coordinates.
53. (Original) An apparatus as set forth in claim 42, wherein the means for producing a three dimensional representation includes animating the three dimensional representation for analysis of the three dimensional representation.

54. (Original) An apparatus as set forth in claim 42, wherein the means for producing a three dimensional representation includes receiving physiological data.

55. (Original) An apparatus as set forth in claim 42, wherein the means for producing a three dimensional representation includes parsing the physiological data.

56. (Original) An apparatus as set forth in claim 55, where in the physiological data is parsed into a series of waveforms.

57. (Original) An apparatus as set forth in claim 56, wherein the series of waveforms are median waveforms.

58. (Original) An apparatus as set forth in claim 42, wherein the means for producing a three dimensional representation includes generating a waveform display on the display.

59. (Original) An apparatus as set forth in claim 58, wherein the waveform display places the data points at respective pixels on the display.

60. (New) A method as set forth in claim 1, wherein the amplitude of the physiological patient data relates to an amplitude of the cyclic physiological waveform.

61. (New) A method as set forth in claim 1, wherein the amplitude of the physiological patient data is an amplitude of the cyclic physiological waveform.

62. (New) A method as set forth in claim 23, wherein the cyclic physiological waveform represents the physiological parameter.

63. (New) A method as set forth in claim 42, wherein the cyclic physiological waveform represents the physiological parameter.

Interview Summary

This Interview Summary is further to the Examiner's Interview between Examiner Tam Tran, Supervisor Matthew Bella, and Applicants' Representative Chad W. Shea (Reg. No. 48,470) on September 8, 2003.

In the Interview, the 35 U.S.C. § 102 (e) rejections of claims 1-59 based on U.S. Patent No. 6,558,325 ("Pang") as discussed in paragraphs 2-13 of the Office action dated July 11, 2003 were discussed. Applicants submitted that Pang does not disclose the display of physiological patient data from a cyclic physiological waveform as suggested in the Office action. Instead, Pang discloses the display of an ultrasound image. Applicants submitted that although the acquisition of data utilized to form the ultrasound image is triggered using respective phases of a cyclic physiological waveform, the displayed ultrasound image does not include physiological patient data from a cyclic physiological waveform. Instead, the ultrasound image includes ultrasound data. Ultrasound data is not physiological patient data from a cyclic physiological waveform.

Supervisor Bella indicated that the claim limitation merely recites "physiological patient data," and that ultrasound data is physiological patient data. As an example, Applicants directed Supervisor Bella's attention to the preamble of claim 1 which includes antecedent basis for the use of "the physiological patient data" in the limitations of claim 1. Accordingly, "the physiological patient data" recited in the limitations of claim 1 is "physiological patient data from a cyclic physiological waveform."

Applicants further suggested that claim 1, and other independent claims, could be amended by copying the "cyclic physiological waveform" into the body of the claim to further clarify that the physiological patient data is from the cyclic physiological waveform.

Supervisor Bella indicated that such amendment seemed reasonable and that he and Examiner Tram would further review the claims based on those amendments. Accordingly, no final agreement regarding the patentability of the claims was reached.